

# **MAGNETIC LEVITATION STAGE APPARATUS AND METHOD**

## **ABSTRACT OF THE INVENTION**

5 A magnetic levitation (maglev) stage apparatus and method is disclosed. The  
maglev stage includes a movable platen having an upper surface capable of supporting  
a workpiece. A set of magnet arrays is arranged on the bottom surface of the platen,  
and first and second side magnet arrays are arranged on opposite sides of the platen.  
A support frame at least partially surrounds the platen on the first and second sides and  
10 the bottom surface. A plurality of motor coils is arranged on the support frame so as to  
be in operable communication with the set of magnet arrays and the side magnet  
arrays. The magnet arrays and motor coils are operable to magnetically levitate the  
platen within the support frame and move the platen in up to six degrees of freedom  
(DOF), with all forces directed through the center-of-gravity of the platen along the  
15 DOF axes. Movable counterweights may also be employed to facilitate the smooth  
movement of the platen.

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